

# INSTALLATION INSTRUCTION MANUAL FOR AMBIRAD VISION® VSO & VSXO RANGE OF RADIANT TUBE HEATERS



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## WARNINGS

AmbiRad equipment must be installed and maintained in accordance with the relevant provisions of the Gas Safety (Installations and Use) Regulations 1998 for gas fired products. Due account should also be taken of any obligations arising from the Health and Safety at Work Act 1974 or relevant codes of practice. In addition the installation must be carried out in accordance with the current IEE wiring regulations (BS 7671), BS 6896:2005 (Industrial & Commercial) and any other relevant British Standards and Codes of Practice by a qualified installer. All external wiring MUST comply with the current IEE wiring regulations.

# Introduction.

Welcome to the new range of high efficiency AmbiRad Vision radiant tube heaters. Local regulations may vary in the country of use and it is the installers responsibility to ensure that such regulations are satisfied

All installation, assembly, commissioning and service procedures must be carried out by suitable qualified competent persons to the statutory regulations in the country of use.

When assembling, installing, commissioning and servicing is undertaken on radiant tube heaters specified in these instructions, due care

and attention is required to ensure that working at height regulations are adhered to at the mounting heights specified.



**PLEASE READ** this document prior to installation to familiarise yourself with the components and tools you require at the various stages of assembly.

All Dimensions shown are in mm unless otherwise stated.

**The manufacturer reserves the right to alter specifications without prior notice.**

# Document Index.

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# Tools required.

The following tools and equipment are advisable to complete the tasks laid out in this manual.



Suitable alternative tools may be used.



Trestles



Leather Faced Gloves



Pozidrive  
Screwdriver



10mm,  
12mm &  
13mm  
Spanners



Wrench with  
Extension



13mm  
Socket



Tape  
Measure



4 & 5mm  
Allen  
Keys



# 1. Installation Requirements.



Isolate any electrical supply to the heater and controller before proceeding.

## 1.1 Health and Safety

AmbiRad heaters must be installed in accordance with the relevant provisions of the Gas Safety (Installations and Use) Regulations 1998. Due account should also be taken of any obligations arising from the Health and Safety at Works Act 1974 or relevant codes of practice. In addition the installation must be carried out in accordance with the current IEE wiring regulations (BS 7671), BS 6896:2005 (Industrial & Commercial) and any other relevant British Standards and Codes of Practice by a qualified installer. Isolate all electrical supplies to the heater & controller before proceeding.

For your own safety we recommend the use of safety boots and leather faced gloves when handling sharp or heavy items. The use of protective eye wear is also recommended.

## 1.2 Model Definitions

**VSOUT** = AmbiRad Vision U Tube Unitary heater with painted induced burner, ID Fan, aluminised steel reflectors, end caps, insulation, tube over shields, painted canopies and optional end covers.

**VSOUH** = AmbiRad Vision U Tube Herringbone heater with painted induced burner, Damper, aluminised steel reflectors, end caps, insulation, tube over shields, painted canopies and optional end covers.

**VSXO** = AmbiRad Vision High efficiency U Tube heater with forced burner, recuperative heat exchanger, aluminised steel reflectors, end caps, insulation, tube over shields, painted canopies and optional end covers.

## 1.3 Heater Suspension



The heater must be suspended by ALL of the suspension brackets.

**i** See fig 3.b. Attachment to the heater support lugs should be made by a 'speed link', D shackle or in the case of drop rods, a closed formed hook. The hanging attachments to overhead steelwork etc. must be purpose made to good sound engineering practice or of a proprietary type fixing. They must be adequately fixed and designed to carry the whole weight of the heater. In the event of suitable roof steelwork being unavailable,

additional steelwork should be fitted to enable vertical hangers to be used for suspending the heaters.

If there are any doubts as to the strength or suitability of roof steelwork to which heaters are to be suspended, please refer to a Consultant, Architect or owner of the building. The recommended mounting heights for AmbiRad heaters are given in the table below.

Model	Recommended Mounting Height (m)	
	Horizontal	Inclined / wall mounted
15	4.6 - 7.0	4.2 - 5.2
20	5.5 - 9.0	4.4 - 5.8
25	6.0 - 11.0	5.0 - 6.1
30	6.9 - 13.5	6.0 - 7.6
35	7.1 - 14.0	6.5 - 8.3
40	7.5 - 16.0	6.7 - 8.7
45	7.9 - 18.0	6.9 - 9.1
50	8.4 - 20.0	7.2 - 9.5

## 1.4 Wall Mounting

These radiant tube heaters can be wall mounted using the appropriate bracket (AmbiRad part no WMB-13-22-38).

When using the wall mounting brackets the heater must be inclined at an angle between 30° and 35°.

U Tube			
Heater Size	Required angle	Chain length	Eyebolt position
15 - 50	30-35°	12 links	1

Figure 3.a. Angle Mounting using the Wall mounting bracket

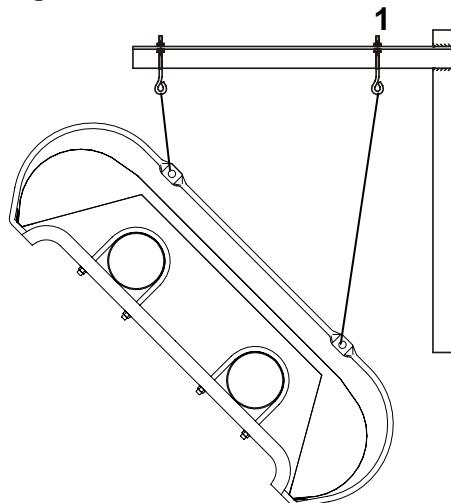
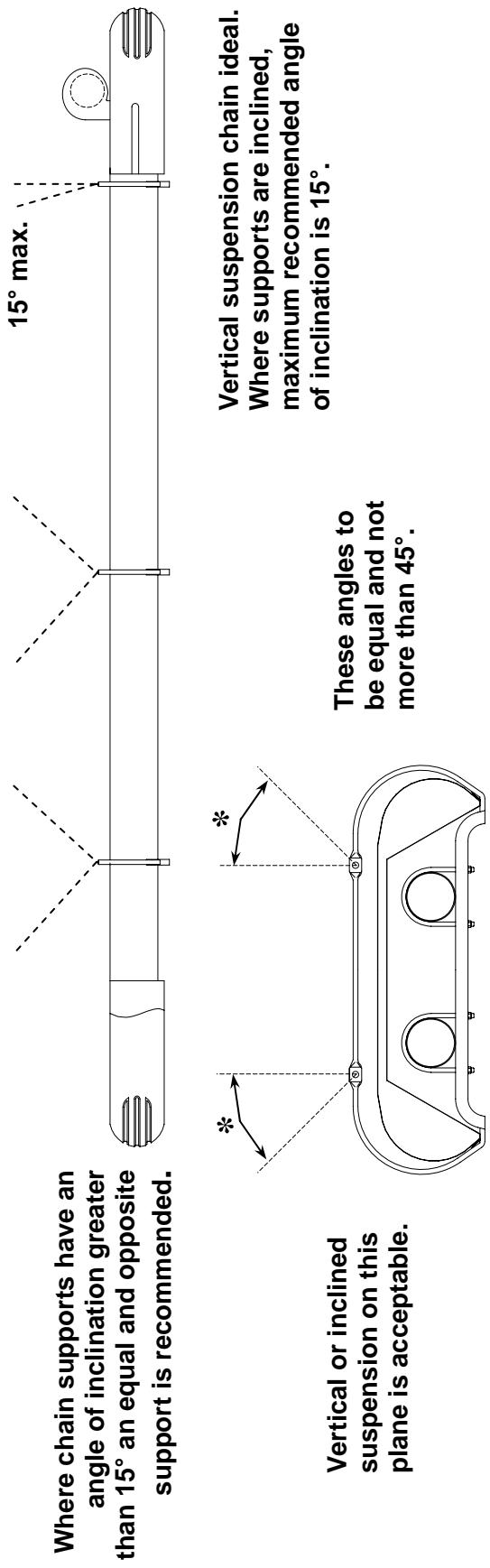
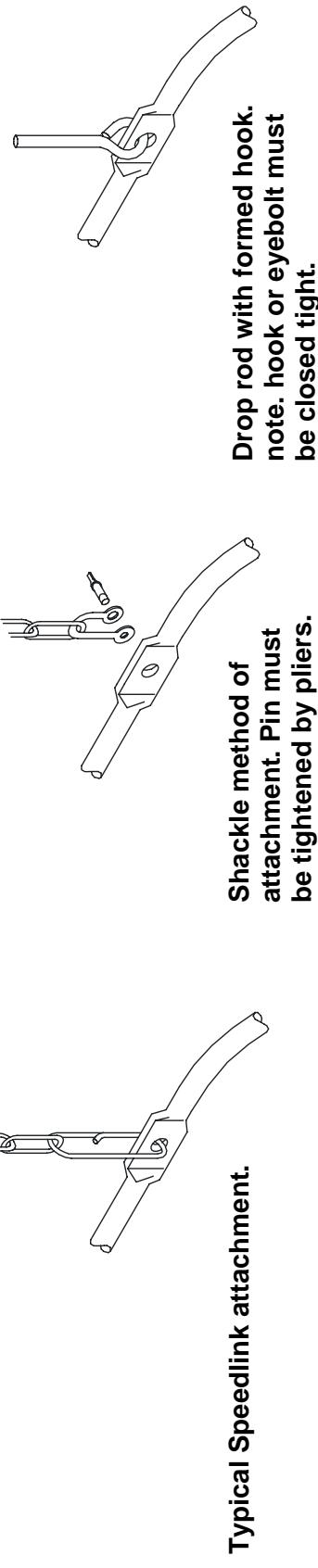


Figure 3.b. Recommended Methods of Heater Suspension.



**ON U TUBE VARIANTS THE HEATER SHOULD SLOPE DOWNWARDS TOWARDS THE RETURN BEND BY APPROX. 10mm FOR BOTH HORIZONTAL AND WALL MOUNTED INSTALLATIONS.**



## 1.5 Herringbone Systems (VSOUH).

The manifold system should be arranged to fall slightly in the direction of the vacuum fan. This ensures that any condensation formed in the manifold on cold start and cool down is not trapped or allowed to drain back into the heater unit. This allows condensate to flow towards the condensate trap located at the vacuum fan end of the manifold system. (See figure 4a below for condensate trap arrangement).

The manifold should be supported by chain, stainless steel flexible wire, or other flexible means from the roof structure to allow movement caused by thermal expansion. For 100mm diameter manifold the maximum distance between supports is 2.4m and 3.0m for 150mm diameter.

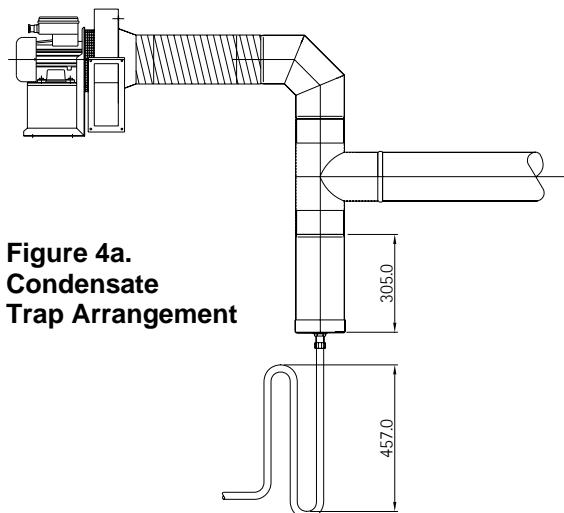
Flexible couplers (supplied by AmbiRad) must be inserted within the manifold system to allow linear expansion to take place and prevent stress and strain on the system.



The manifold must be supported either side of the flexible coupler.

The exhaust flue should be adequately supported from the building structure and installed in accordance with the British Standard Code of Practice BS 5440: Part 1:2000 – Installation and maintenance of flues and ventilation for gas appliances of rated input not exceeding 70kW net (1st, 2nd and 3rd family gases)

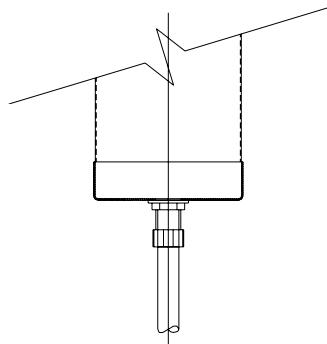
A condensate trap assembly must be provided at the end of the manifold system before the hot gas vacuum fan.



**Figure 4a.**  
Condensate  
Trap Arrangement

The minimum depth of the condensate collecting chamber shall be 305mm and the minimum depth of the condensate drain pipe

'U' trap shall be 457mm deep. The end cap of the collecting chamber to be fitted with a flush flanged tank connector. Any protrusion to be removed leaving the inside flush with end cap.



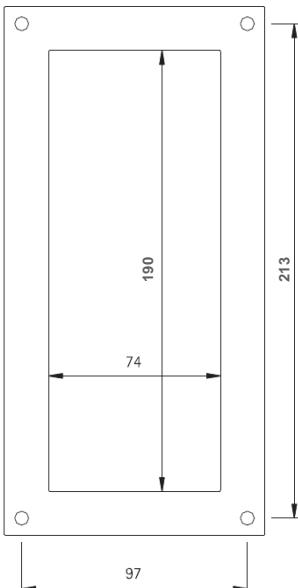
**Figure 4b. Collecting Chamber Arrangement**

The end cap should be sealed with silicon jointing compound and pop riveted in position. All condensate drains from the flue collecting chamber to the disposal point shall be corrosion-resistant material of not less than 22mm internal diameter. Copper or copper based alloy shall not be used for condensation drains. See reference BS 6896:2005. Condensate drain pipes must be protected against the effects of freezing.

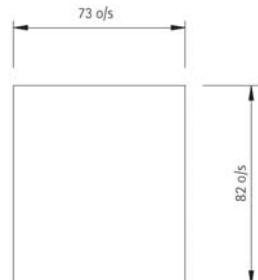
The Type '0' and Type '2' vacuum fans have bottom horizontal discharge with rectangular connections (flanged on the type 0) and must be mounted in that position by means of the fan support stool onto a suitable platform or brackets fixed to the building structure.

For details of the fan outlet fixing holes see below.

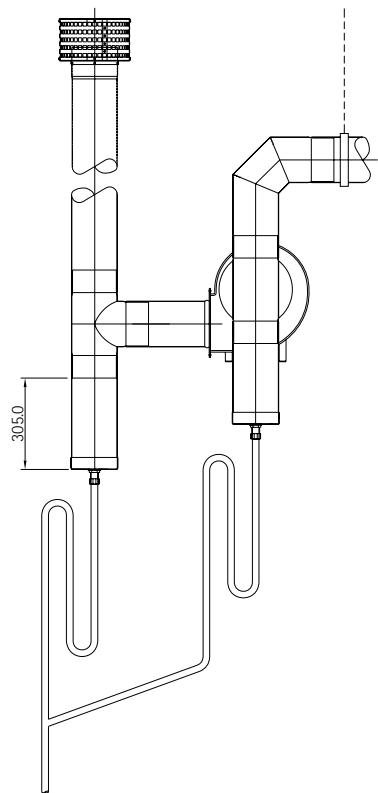
**Figure 4c. Type 'O' Fan Outlet Dimensions**



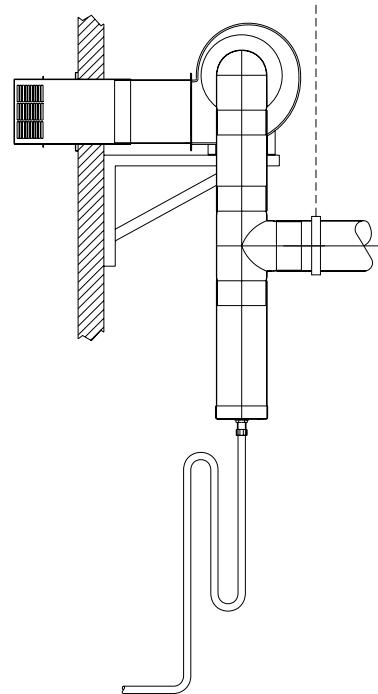
**Figure 4d.**  
Type 2 Fan  
Outlet Dimensions



For details of fan mounting bracket and fixing down holes see figure 5.



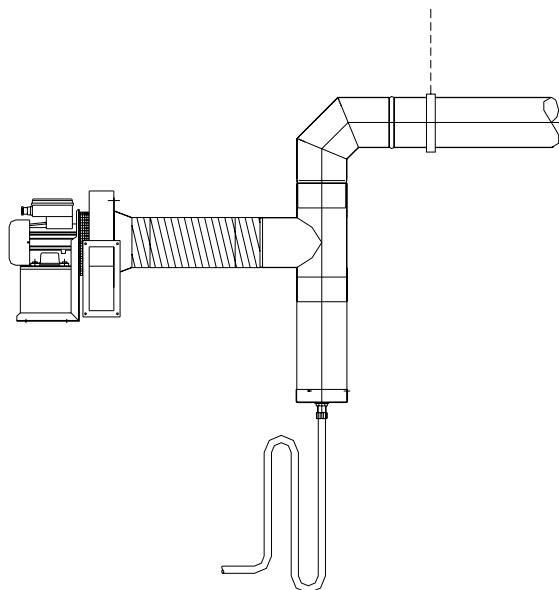
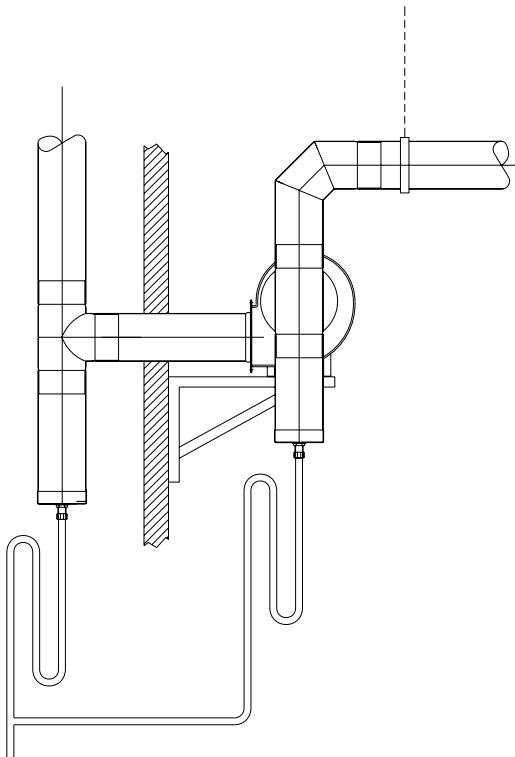
**Figure 4e. Conventional Flue Arrangement  
Roof Exit.**



**Figure 4g. Stainless Steel Telescopic  
Through The Wall Arrangement (available for  
Type 'O' and Type '2' fans)**

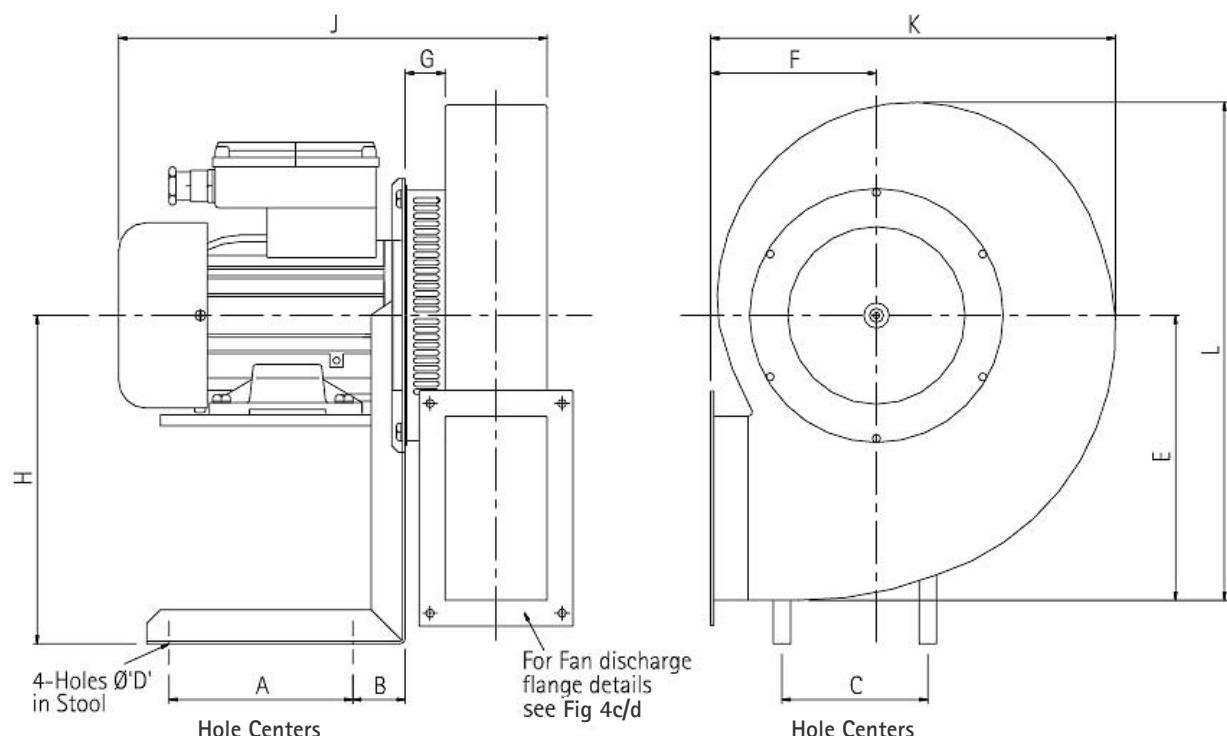
Where a conventional flue is to be installed, AmbiRad supply an aluminium transformation piece to which a 150mm (6ins) diameter flue must be attached.

The length of flue which may be connected to the fan outlet must be adequately supported from the building structure.



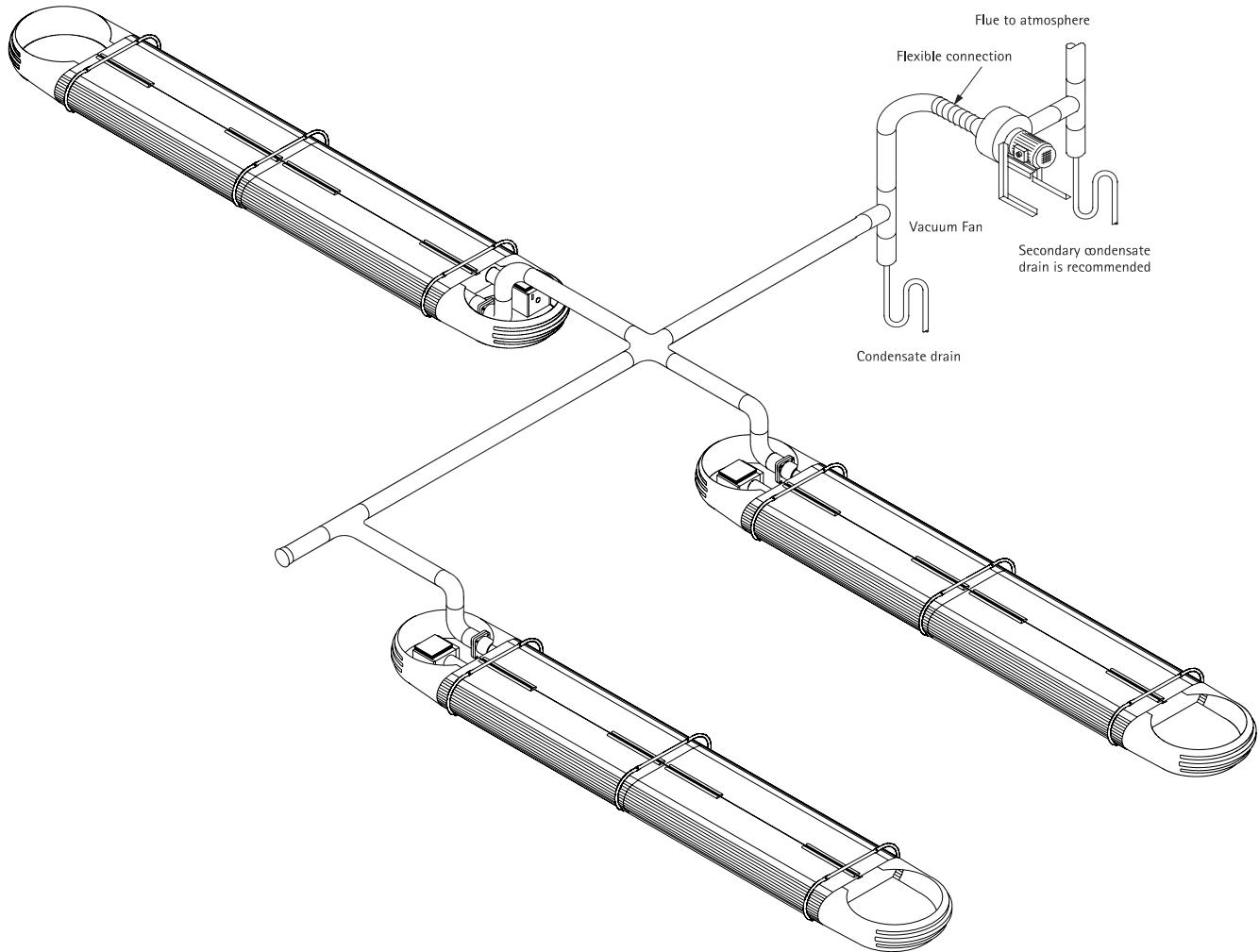
**Figure 4f. Conventional Flue Arrangement  
Wall Exit.**

**Figure 5. Vacuum fan mounting details (Type 'O' fan illustrated)**



Fan	Type O	Type 2
A	124	80
B	38	35
C	175	174
D	7.1	7
E	209	125
F	153	100
G	42	25
H	239	120
J	340	210
K	332	205
L	363	215
Power (watts)	550	120
Running Current (amps)	2.6	0.8
Voltage	230V 1ph	230V 1ph

**Figure 6. Typical Herringbone system (VSO shown with optional end covers)**



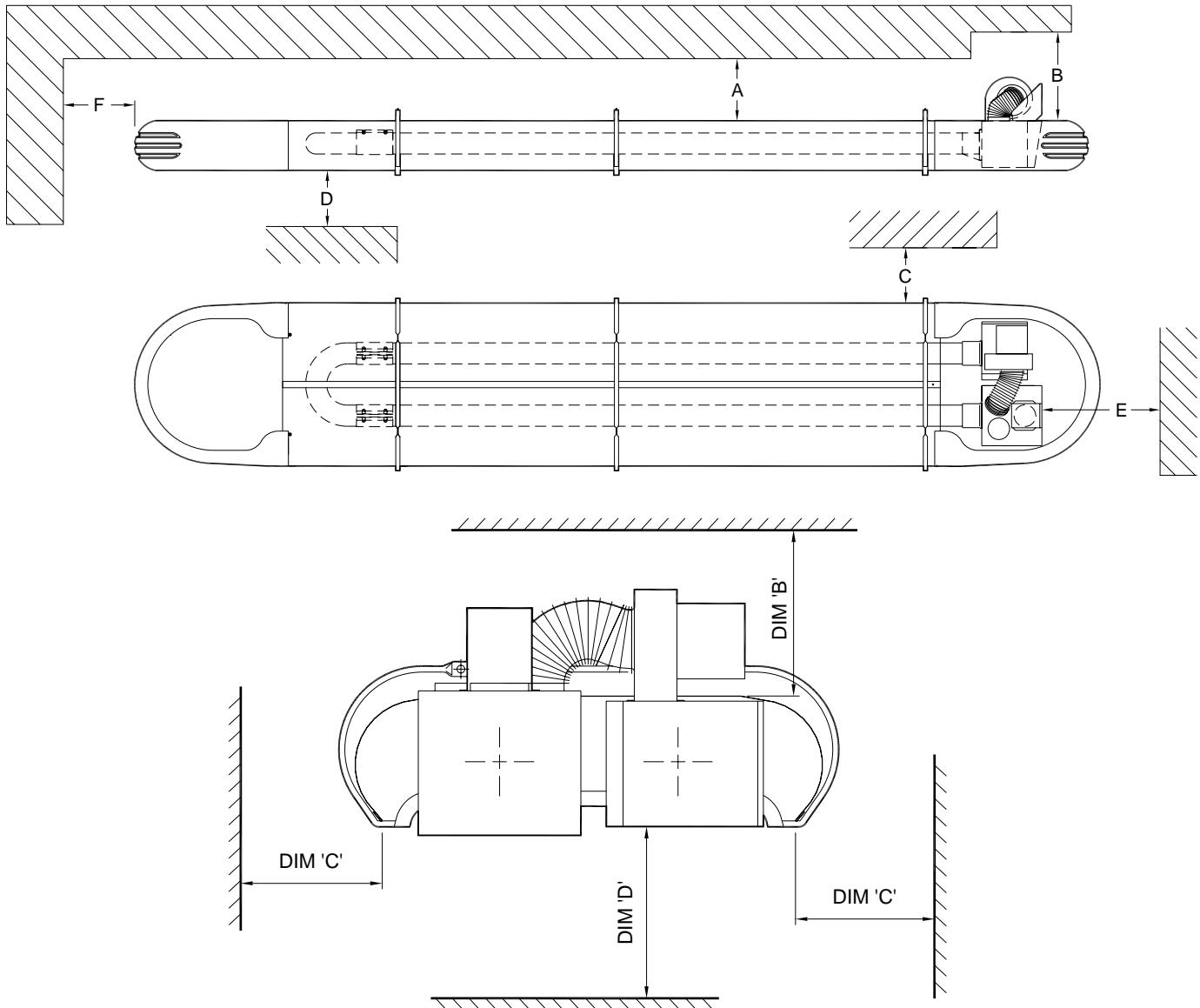
#### Dos and don'ts of herringbone system

<b>Dos</b>	<b>Don'ts</b>
Check design pressure drop.	Run drains in copper or mild steel pipework.
Check for corrosive industrial process in proposed building - e.g. cleaning, electroplating, printers using sugar powder etc.	Install system with extra 90° bends without asking AmbiRad if the system will operate correctly.
Drain all flue ducts and seal all joints.	Install flue with vertical rise without firstly fitting a drain point at it's lowest level.
Secure joints with pop rivets as well as sealing compound (refer to assembly instructions).	Fit fan with outlet vertical or with top horizontal discharge.
Fit drain traps before and after fans (see figs 4).	Fit damper upside down or on it's side.
Fit expansion joints before fan and at intermediate points on the herringbone system.	Fit damper wrong way round. (see fig14 page 31.)
Run drains in galvanised steel or plastic pipes.	
Follow guide to combined flue heating system.	

## 1.6 Clearance to Combustibles.

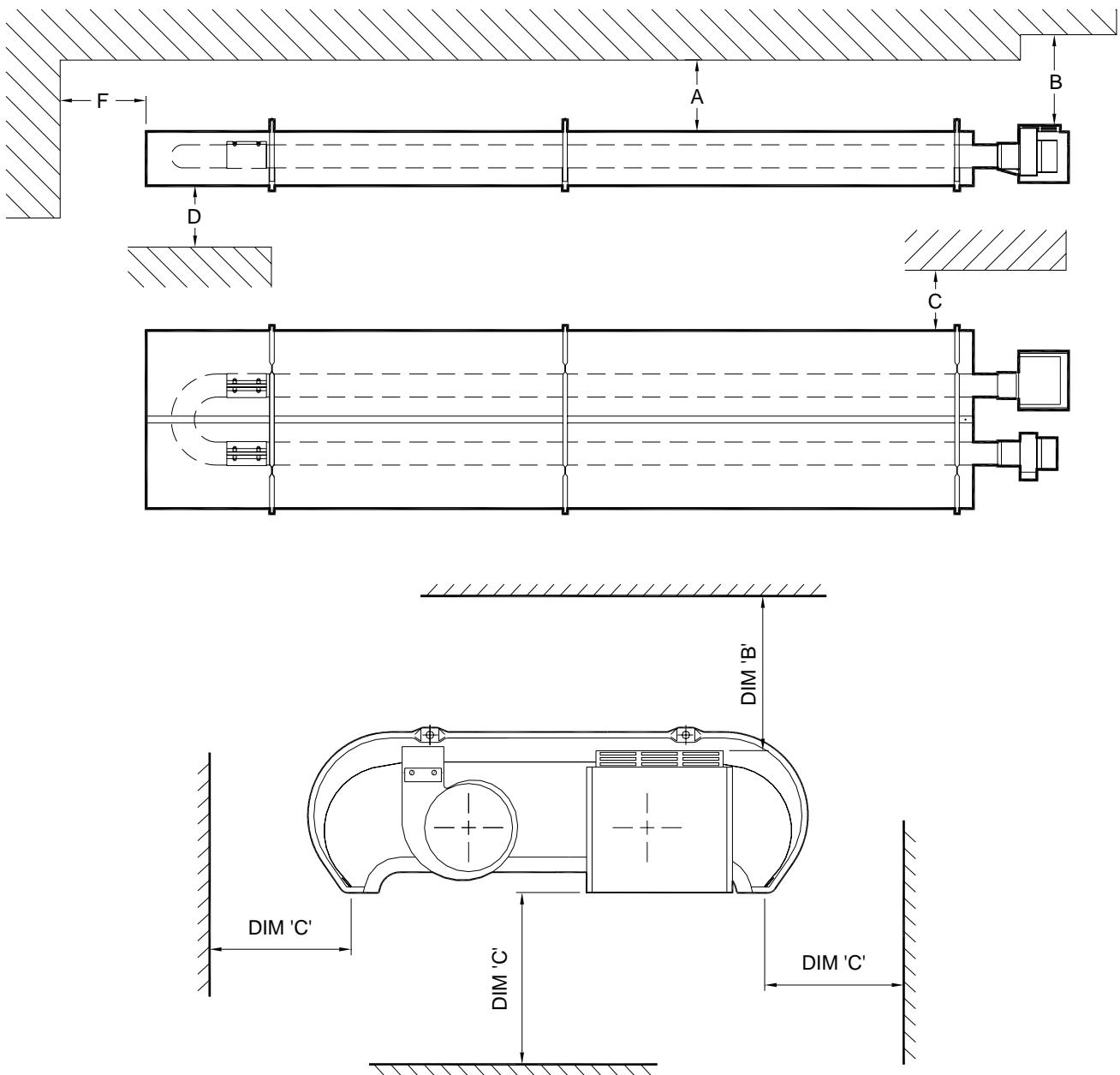
 The minimum clearances to combustible materials are given in the tables below. These minimum distances MUST be adhered to at all times.

**Figure 7.a Diagram illustrating the clearance to combustibles (VSXO shown c/w End Covers)**



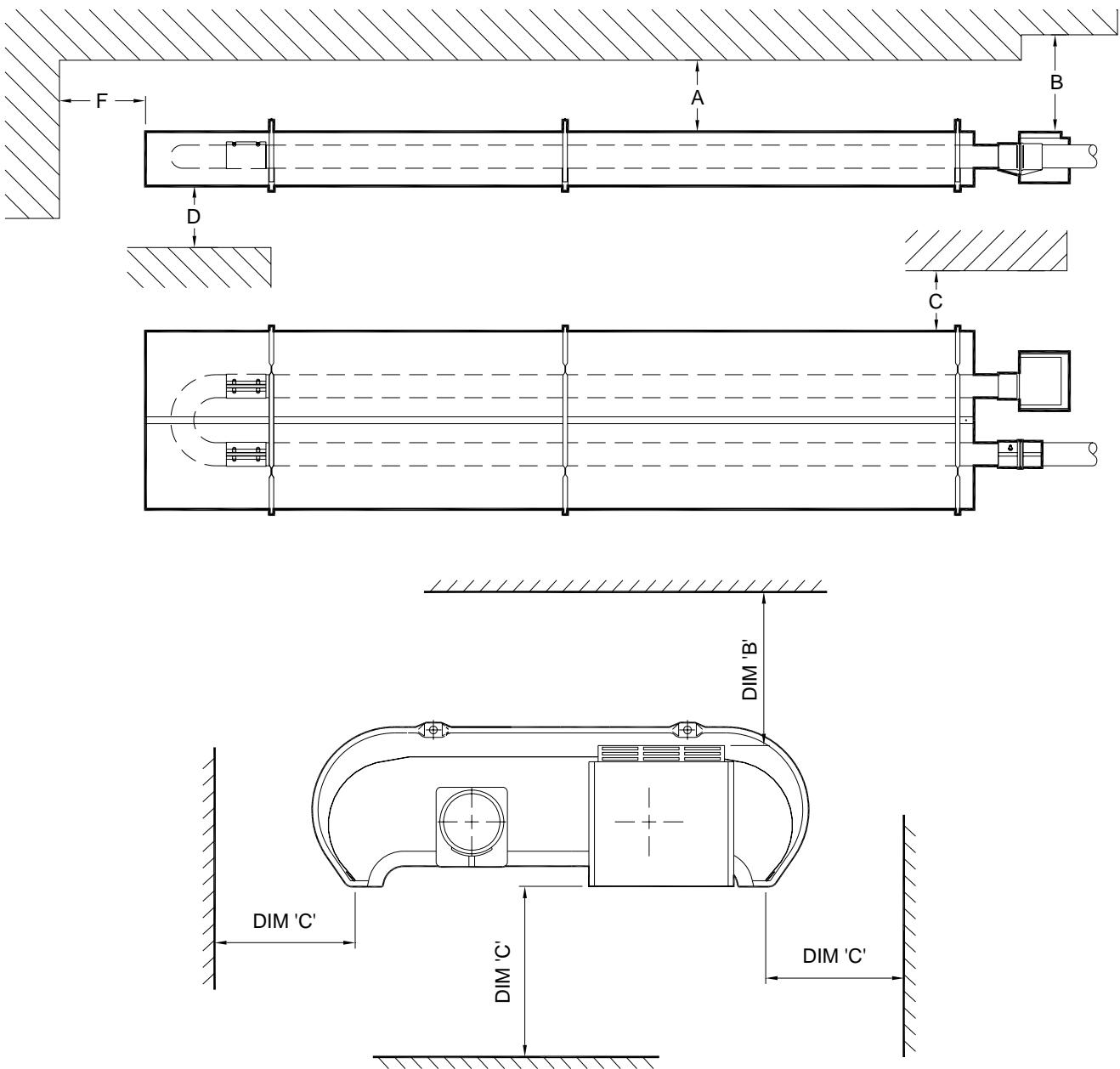
VSXO		20/25	30/35/40	45/50
Above Canopy	A	100	100	100
Above Burner / Flued Heat Exchanger	B	500	500	500
Above Burner / Heater Outlet Unflued	B1	700	700	700
To the Sides	C	915	1200	1525
Below Tubes	D	2330	2330	2330
From Heater Outlet (UNFLUED)	E	570	940	940
End Wall	F	390	470	575

**Figure 7.b Clearance to combustibles Vision Optima Unitary VSO UT**



VSO UT		15/20/25	30/35/40	45/50
Above Canopy	<b>A</b>	100	100	100
Above Burner / Flued Heat Exchanger	<b>B</b>	500	500	500
Above Burner / Heater Outlet Unflued	<b>B1</b>	700	700	700
To the Sides	<b>C</b>	915	1200	1525
Below Tubes	<b>D</b>	2330	2330	2330
From Heater Outlet (UNFLUED)	<b>E</b>	570	940	940
End Wall	<b>F</b>	390	470	575

**Figure 7.c Clearance to combustibles Vision Optima Herringbone VSO UH**



VSO UH Herringbone		15/20/25	30/35/40	45/50
Above Canopy	<b>A</b>	100	100	100
Above Burner / Flued Heat Exchanger	<b>B</b>	500	500	500
Above Burner / Heater Outlet Unflued	<b>B1</b>	700	700	700
To the Sides	<b>C</b>	915	1200	1525
Below Tubes	<b>D</b>	2330	2330	2330
From Heater Outlet (UNFLUED)	<b>E</b>	570	940	940
End Wall	<b>F</b>	390	470	575

## 1.7 Gas Connection and Supply

**!** Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

A competent or qualified engineer is required to either install a new gas meter to the service pipe or to check that the existing meter is adequate to deal with the rate of gas supply required. Installation pipes should be fitted in accordance with BS 6896:2005, so that the supply pressure, as stated in Table 4 will be achieved. It is the responsibility of the competent engineer to ensure that other relevant Standards and Codes of Practice are complied with in the country of installation. Pipes of smaller size than the heater inlet gas connection must not be used. The complete installation must be tested for soundness as described in the country of installation.

**!** The gas union service cock MUST be fitted in the gas supply close to the heater, but not onto the burner itself.

**i** Take care when making a gas connection

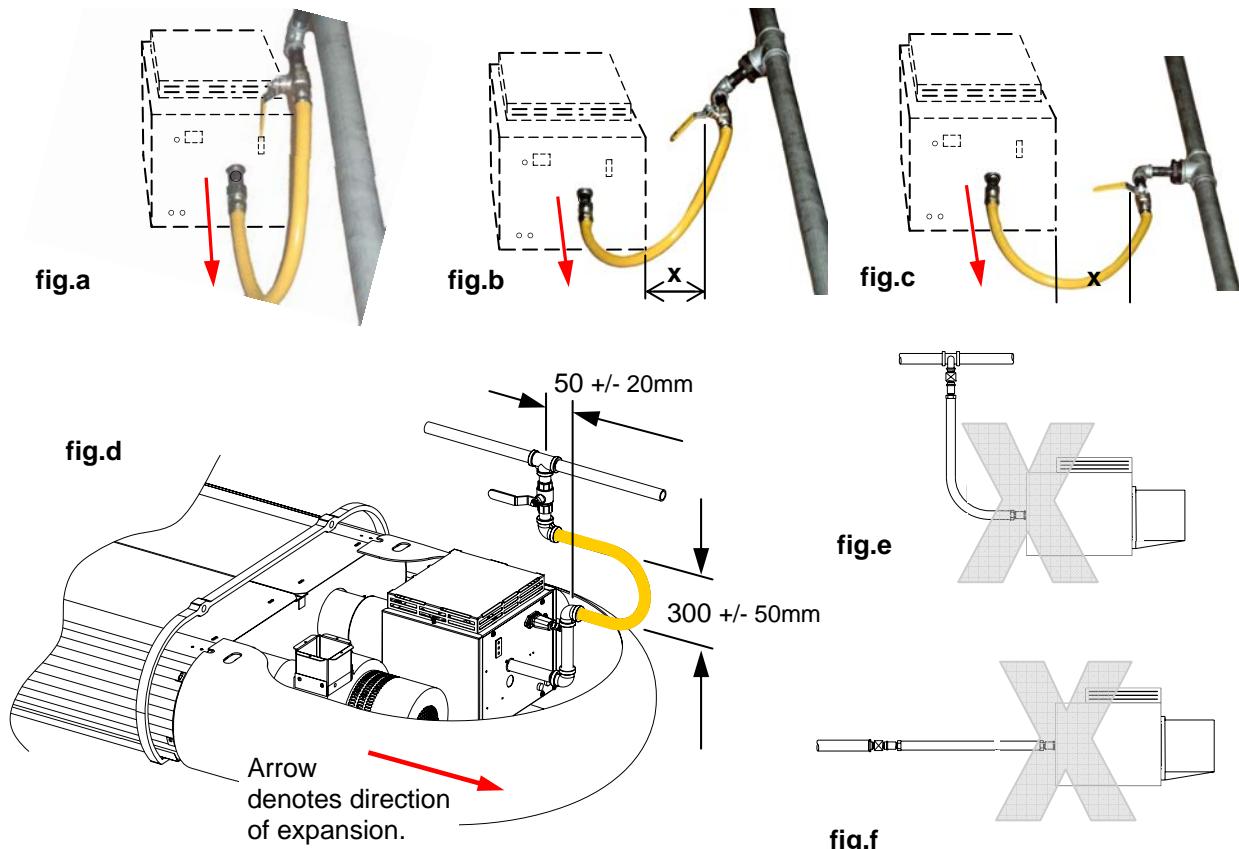
to the heater not to apply excessive turning force to the internal controls.

A flexible hose is installed to allow safe linear expansion of the heater without creating undue stress on the gas supply pipe work. It is therefore important that a tested and certified hose assembly made to ISO 10380 2003, supplied with  $\frac{1}{2}$ " BSP female cone seat adapters, is installed as per these instructions.

It is also important to ensure that expansion is taken up in the body of the flexible hose, and not on its attachment to the pipe work. The cone seat adapter supplied on one end of the flexible gas hose provides a 'swivel' action, and must be fitted on the burner using a  $\frac{1}{2}$ " BSP barrel nipple to provide ease of disconnection for future servicing. This assumes that the heater and fixed gas supply to the isolating valve have been installed.

**i** The installation layout described below is the only method recommended by the institute of gas engineers, the hose manufacturer, and AmbiRad and must only be carried out by a qualified/competent gas engineer.

Figure 8. Correct Installation of Flexible Gas Connection



The methods shown in fig.e and fig.f are unacceptable, due to undue stress on the hose & fittings.

Depending on the specific installation, the flexible gas hose may be routed to the gas cock at any of the following angles in relation to the burner:

- Vertical (fig.a)
- 45° angle (fig.b)
- 90° angle (fig.c)

Any other position in between these angles is acceptable.

**!** A clearance distance 'x' of min 200mm must be observed to allow side door access .

Care must be taken to observe the minimum pipe bend diameter (minimum 250mm, maximum 350mm) & pipe expansion distance (minimum 30mm, maximum 70mm) as shown in fig.e.

**i** Maximum bend diameter for the 1000mm hose is 450mm.

**i** The correct installation as shown will allow for approx 100mm of movement due to expansion.

**Table 4 Gas Supply Pressures**

Gas Category	I2H	I3P
Gas Type	Natural Gas (G20)	Propane (G31)
Max Supply Pressure (mbar)	25	45
Min Supply Pressure (mbar)	17	25
Nominal Pressure (mbar)	20	37
Gas Supply	Connection R½ ½in BSP Internal Thread	

## 1.8 Electrical Connection

This appliance must be earthed.

Supply 230V 50Hz single phase.

Standard heater 116W.

Current rating 0.55 amp max (inductive).

Fuse: external 3 amp.

All electrical work should be carried out to IEE standards by a competent electrician. The electrical connection to the heater is made by means of a three pin plug-in power connector.

Live, neutral and earth connections should be made via a flexible supply cable to the power connector and routed clear of the heater or tubes.

The flexible supply cables should be of 0.5mm<sup>2</sup> and comply with BS 6500:2000. The wires in the mains lead are coloured in accordance with the following code:

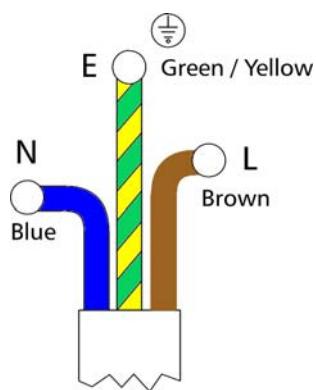
Green & Yellow Earth;  
Blue Neutral;  
Brown Live

It is recommended the heater or group of heaters are controlled by thermostats, a time switch and if required manual control switches and a frost thermostat.

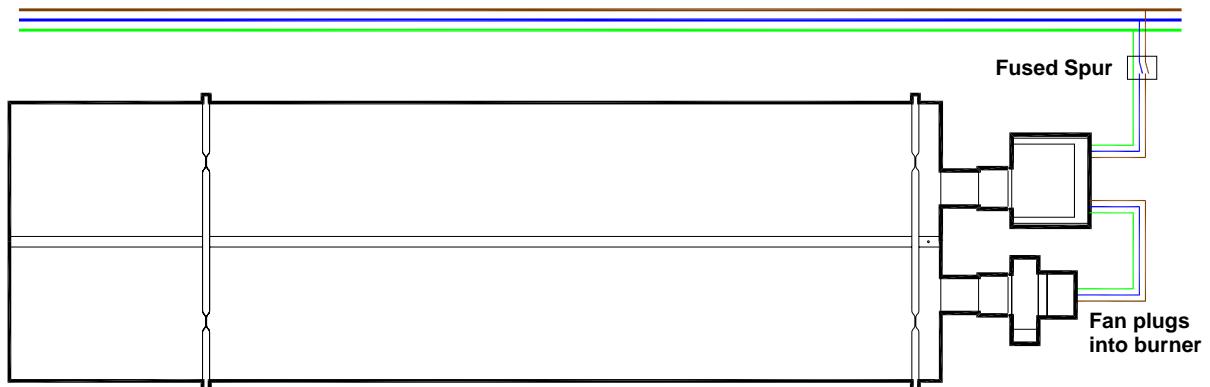
**i** We recommend use of AmbiRad approved controls. Please refer to control manual for siting and installation details.

Where alternative manufacturers controls are used, please refer to their instructions for their siting and installation details.

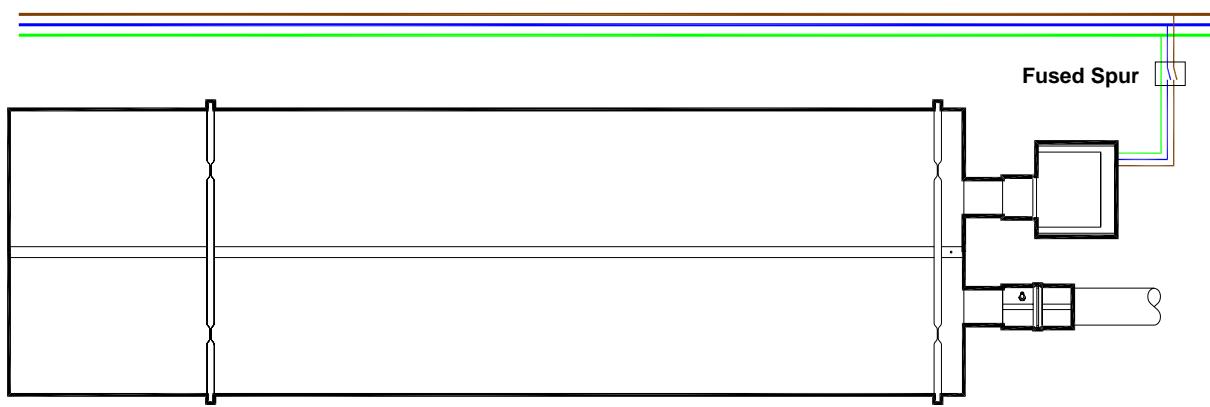
**Figure 9.a Single Phase Wiring**



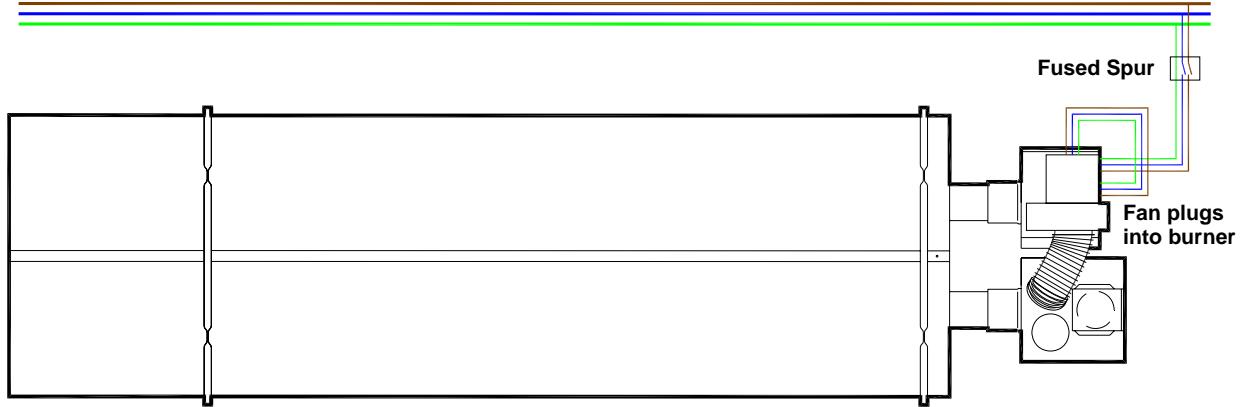
**Figure 9.b Typical VSOUT Induced Unitary Wiring Connections (end covers not shown)**



**Figure 9.c Typical VSOUH Herringbone Wiring Connections (end covers not shown)**



**Figure 9.d Typical VSXO Powered Burner Unitary Wiring Connections (end covers not shown)**



**Figure 9.e Typical VSXO Powered burner Wiring Connections (end covers shown)**

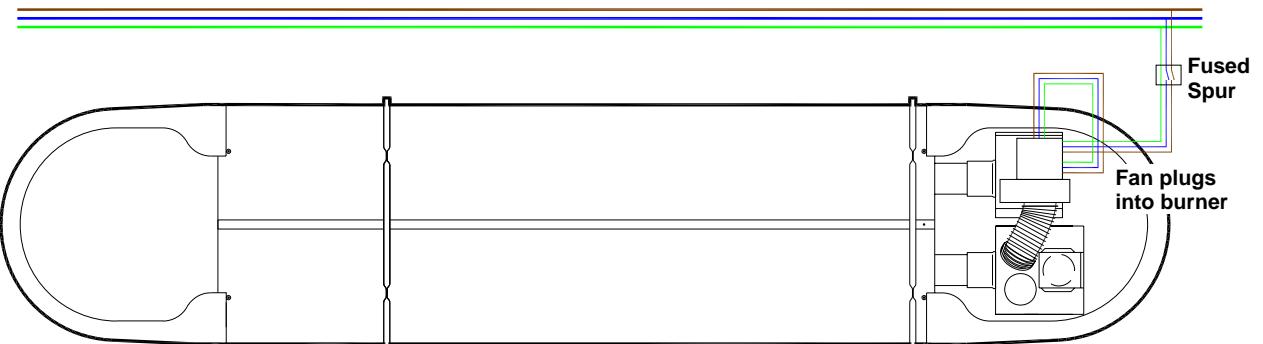
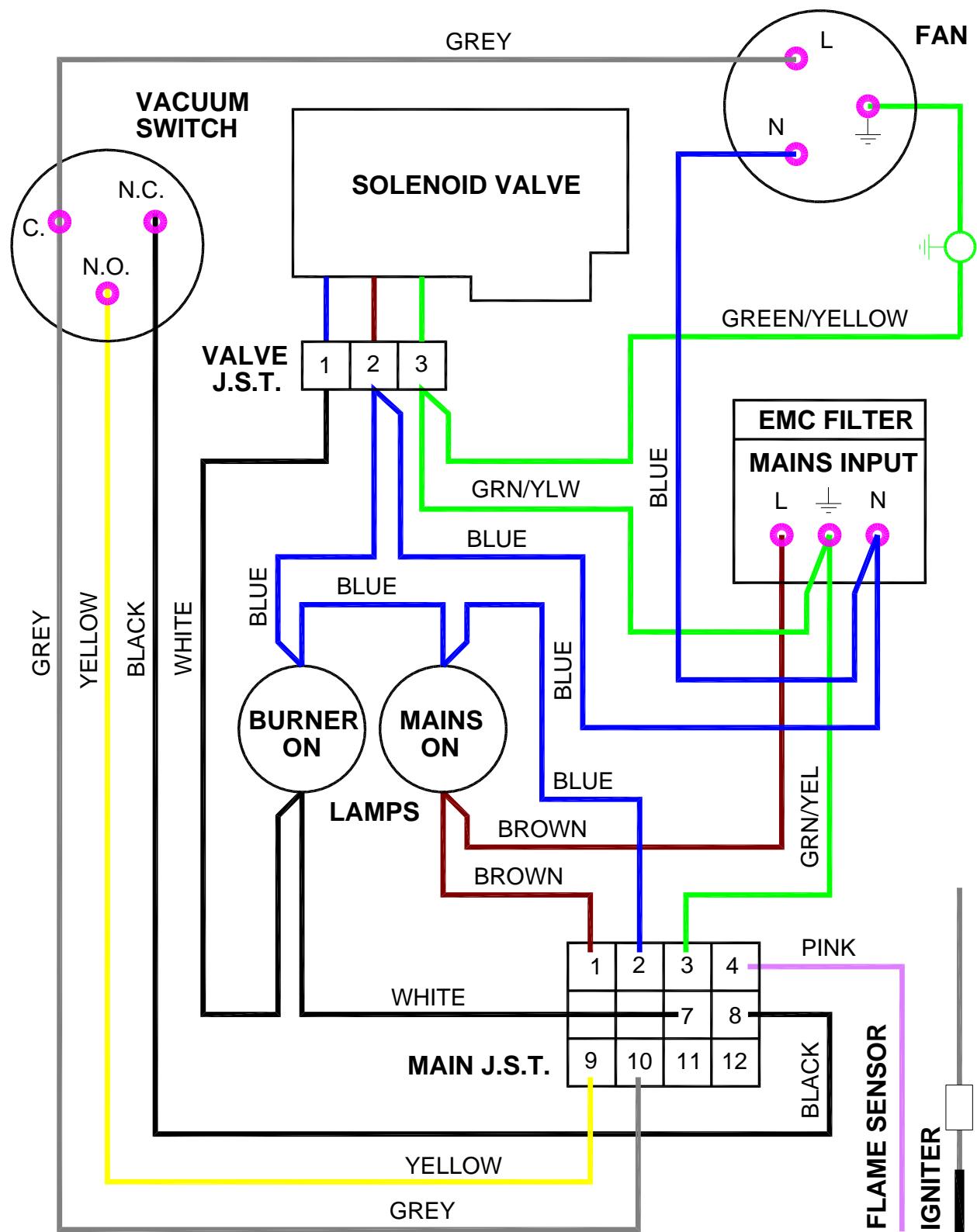
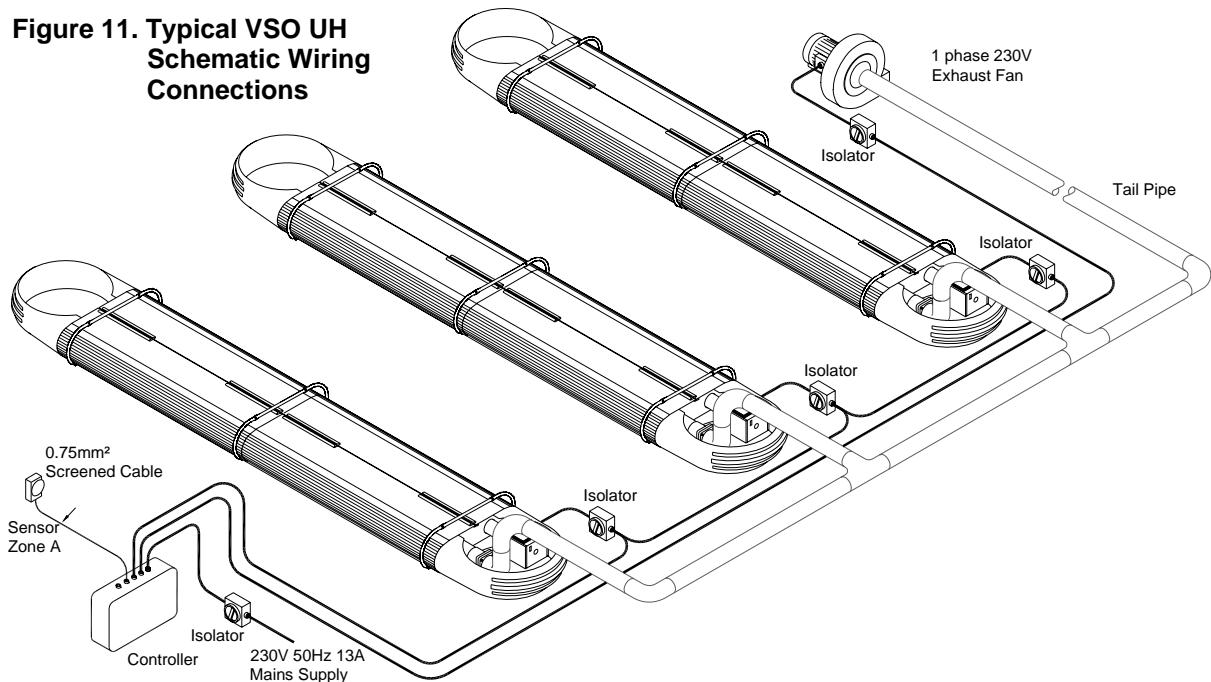


Figure 10. Internal Burner Wiring Diagram.



**Figure 11. Typical VSO UH Schematic Wiring Connections**



## 1.9 Ventilation Requirements

AmbiRad tube heaters can be operated as flued or unflued appliances in accordance with the relevant national requirements in the country of installation.

### 1.9.1 Unflued Radiant Heater

Radiant tube heaters can be operated as unflued appliances so that the concentration of Carbon Dioxide ( $\text{CO}_2$ ) at positions where the air will be inhaled does not exceed 0.28%.

BS EN 13410:2001 is a guide to achieving this requirement.

If the building air change rate exceeds 1.5 per hour or if the heat input is less than  $5\text{W}/\text{m}^3$ , no additional ventilation is required.

In addition to the ventilation requirements, consideration needs to be given to the possibility of condensation forming on cold surfaces.

It should be noted that the clearance distance around the burner increases when the unit is operated unflued (see section 1.6). It should be ensured that the combustion gases do not impinge on any combustible materials.

#### Mechanical Ventilation

Mechanical ventilation must be installed to meet a minimum of 1.5 air changes per hour using appropriately sized fans and interlocked with the heaters.

#### Natural Ventilation

BS EN 13410:2001 should be used to size air

vents to provide adequate ventilation, an example of this calculation is given below:

#### Site Details:

20°C Internal Operating Temperature

0°C Outside Air Temperature

5m between high and low level vents

Following the sizing procedure in BS EN 13410:2001 gives an air exit velocity of 1.6m/s. This equates to a free area vent at both high level and low level of  $17.36\text{cm}^2/\text{kW}$  free area.

### 1.9.2 Flued Radiant Heater

In buildings having an air change rate of less than 0.5 per hour, additional mechanical or natural ventilation is required. For detailed information, please see BS6896:2005 section 5.2.2.2.1

#### Mechanical Ventilation

Mechanical ventilation must be installed to meet a minimum of 0.5 air changes per hour using appropriately sized fans and interlocked with the heaters.

#### Natural Ventilation

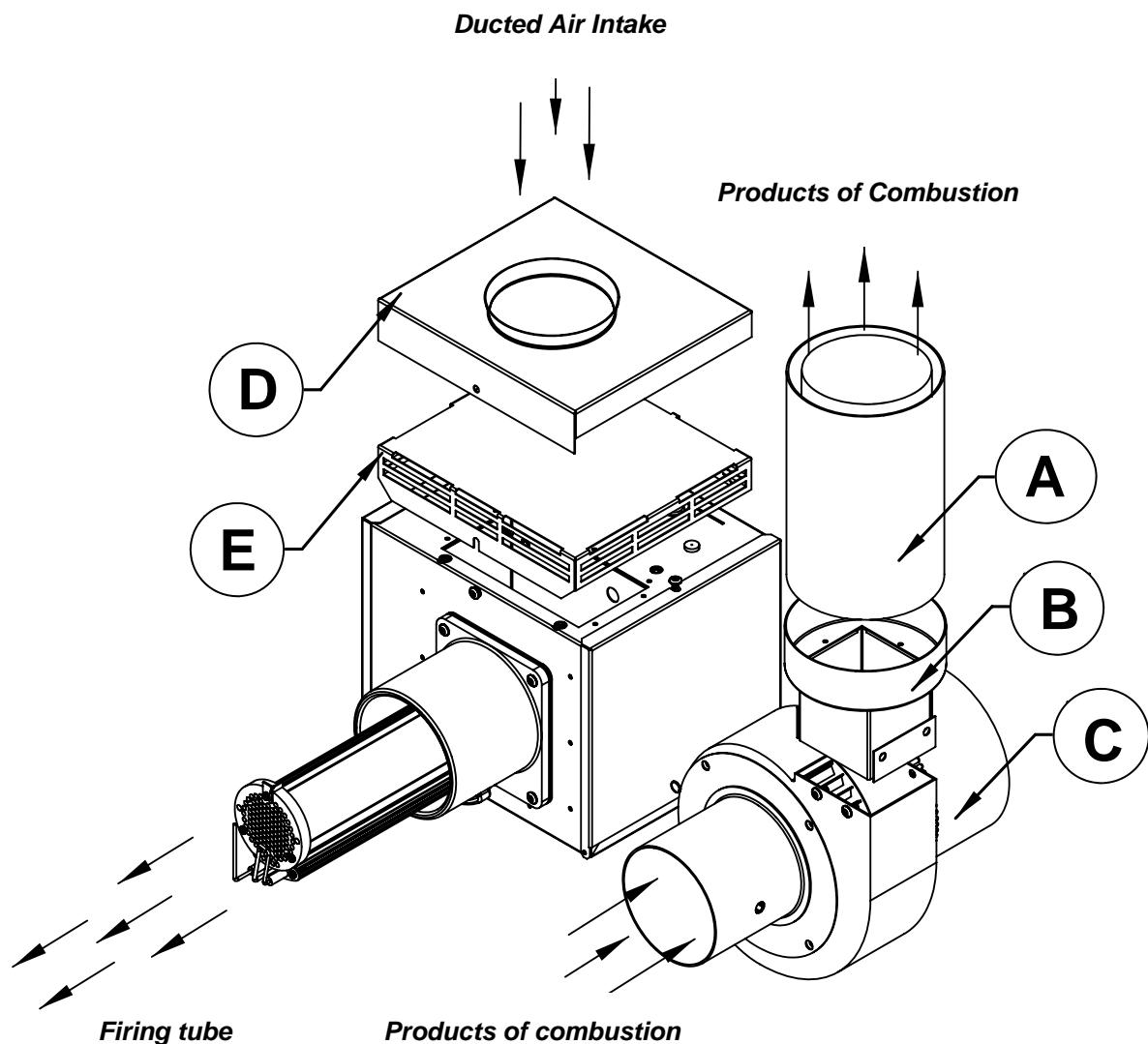
Low level ventilation openings with a free area of at least  $2\text{cm}^2/\text{kW}$  shall be provided. See section 5.2.2.2.1.

## 1.10 Flue and Combustion Air Inlet - Options

Induced Burners without Heat Exchangers  
Please refer to Figure 12 for options.

**Option 1 - Figure 12a. Air Inlet Attachments Unitary Herringbone Burners (VSO)**

**For non-flued installations, delete items A and B and rotate fan outlet to the HORIZONTAL position away from the burner.**



! Ventilation requirements are as detailed in section 1.9

A 127mm (5ins) Twin Wall Flue System

B Fan Adaptor 7177-SUB

C Fan 2501/2507 or 2560

D Optional Ducted Air Intake. VSI-DA

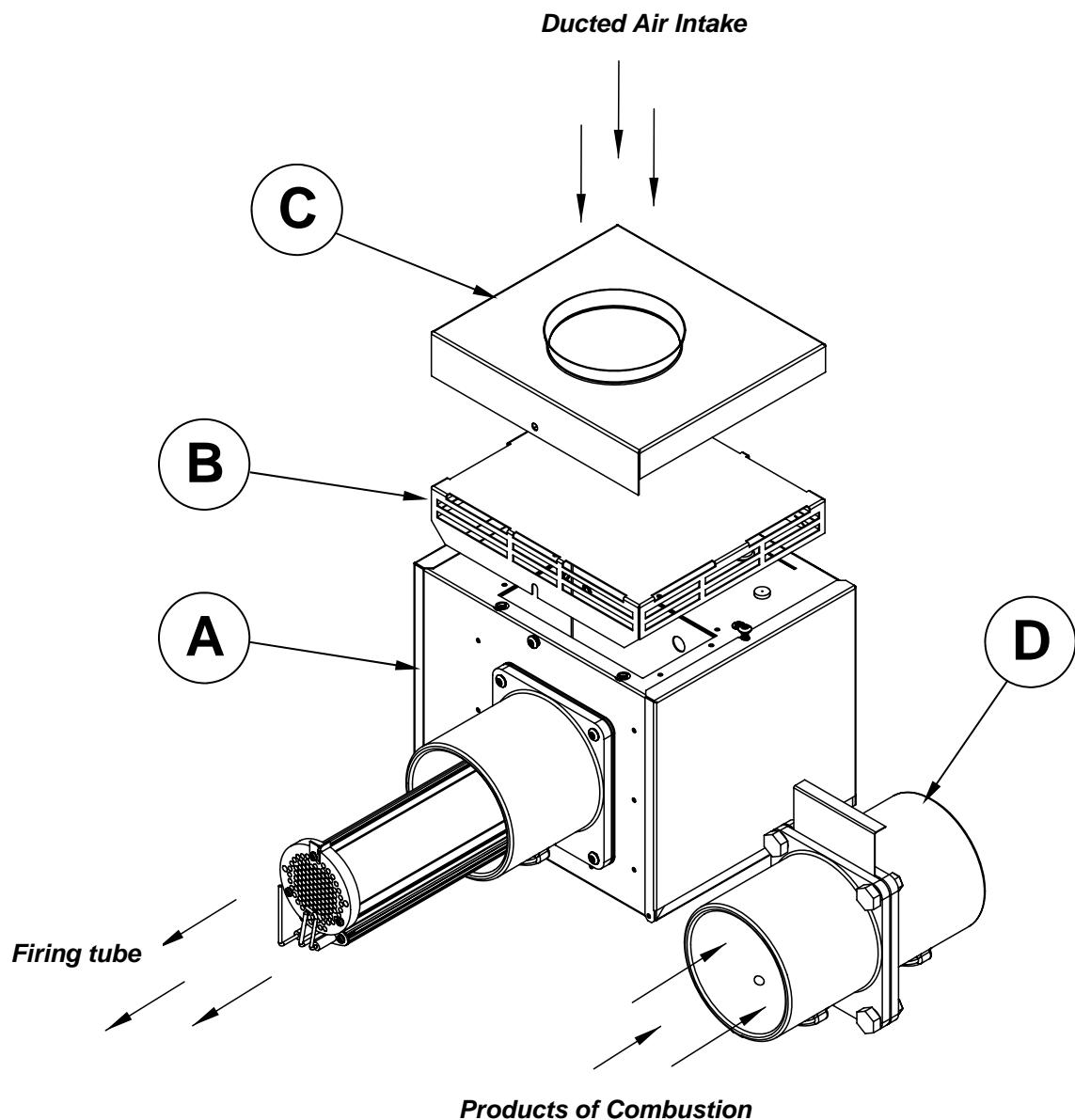
E Air Intake (supplied as standard)

! Ducted air must be used in locations where there is airborne dust or where there is a polluted atmosphere e.g. Chlorinated Vapours.

i Maximum length = 9m  
Minimum diameter = 100mm  
Maximum no of bends = 2

i Maximum flue length = 9.5m @ Ø125mm  
Maximum no of bends = 2  
All flues must terminate vertically.  
For further information on flue runs, please refer to BS 5440 pt.1 2000

Option 1 - Figure 12b. Air Inlet Attachments Induced Herringbone Burners (VSO)



Ventilation requirements are as detailed in section 1.9



Ducted air must be used in locations where there is airborne dust or where there is a polluted atmosphere e.g. Chlorinated Vapours.



Maximum length = 9m  
Minimum diameter = 100mm  
Maximum no of bends = 2

**A** Induced Burner

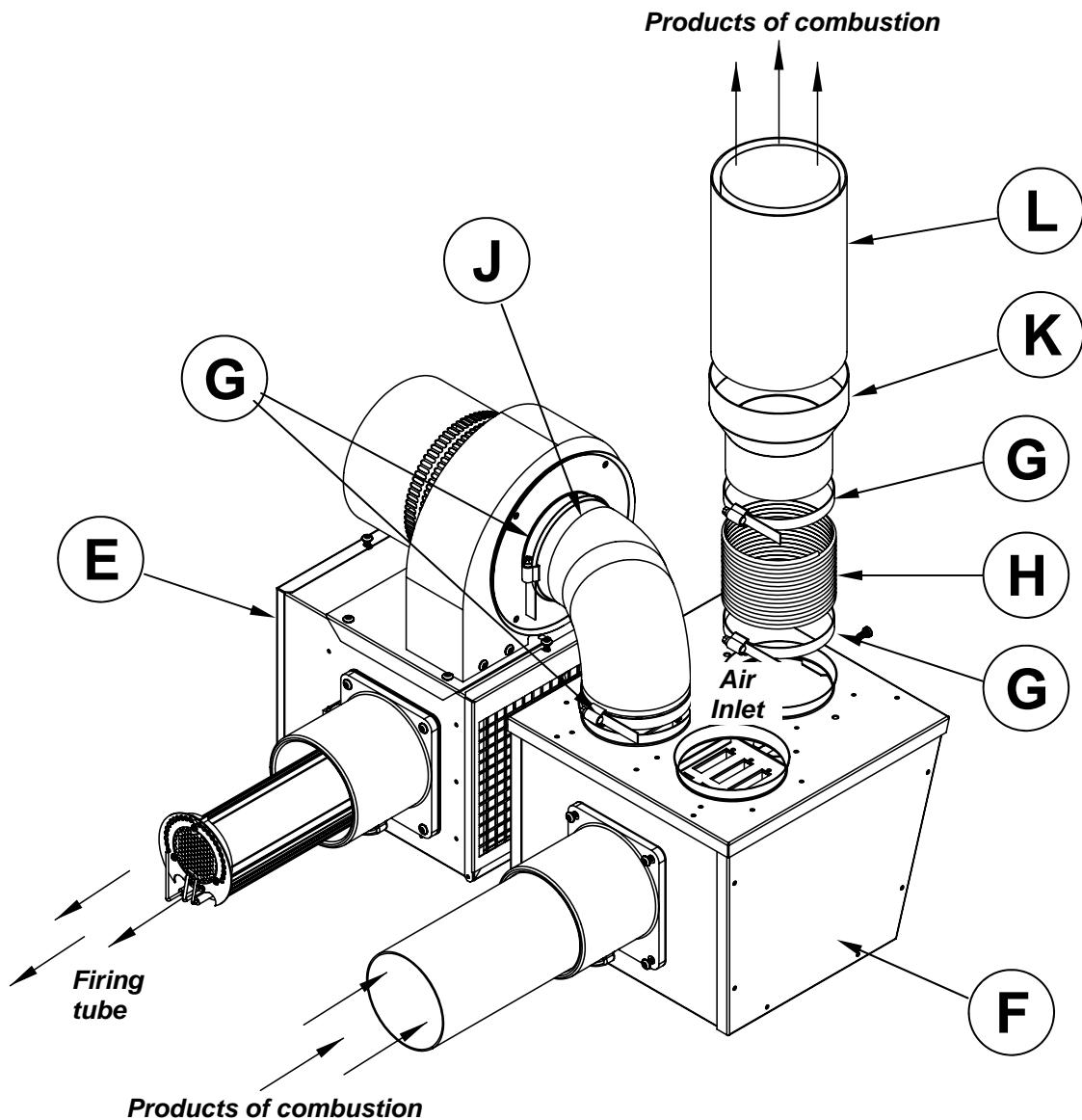
**B** Air Intake (supplied as standard)

**C** Optional Ducted Air Intake. (see notes)

**D** Damper assembly

**Option 2 - Figure 12c. Forced Burner with Heat Exchanger (VSXO Standard Flue)**

For flued products of combustion and no ducted air



**i** Maximum flue length = 9.5m @ Ø125mm  
 Maximum no of bends = 2  
 All flues must terminate vertically.  
 For further information on flue runs, please refer to BS 5440 pt.1 2000

**!** Ducted air must be used in locations where there is airborne dust or where there is a polluted atmosphere e.g. Chlorinated Vapours.

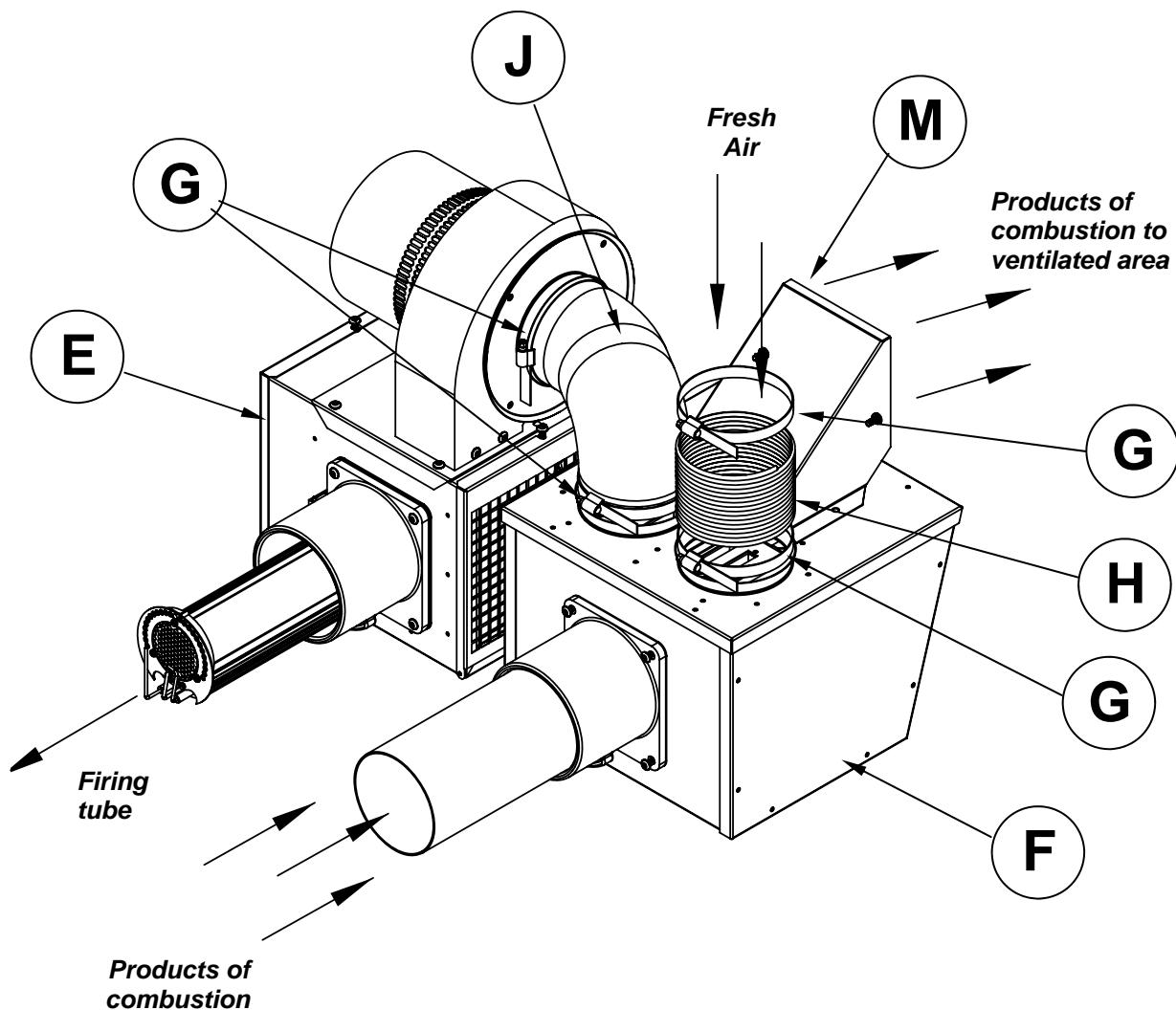
**i** Maximum length = 9m  
 Minimum diameter = 100mm  
 Maximum no of bends = 2

<b>E</b>	<b>Forced Burner</b>
<b>F</b>	<b>Heat Exchanger</b>
<b>G</b>	<b>100mm (4ins) Clips x2</b>
<b>H</b>	<b>100mm (4ins) Flexible Flue</b>
<b>J</b>	<b>100mm (4ins) Flexible Flue to Fan</b>
<b>K</b>	<b>127mm (5ins) to 100mm (4ins) Reducer</b>
<b>L</b>	<b>127mm (5ins) Twin Wall Flue Pipe</b>

**!** Ventilation requirements are as detailed in section 1.9

**Option 3 - Figure 12d. Forced Burner with Heat Exchanger (VSXO No External Flue)**

For ducted air and products of combustion to ventilated area



Ventilation requirements are as detailed in section 1.9



Ducted air must be used in locations where there is airborne dust or where there is a polluted atmosphere e.g. Chlorinated Vapours.

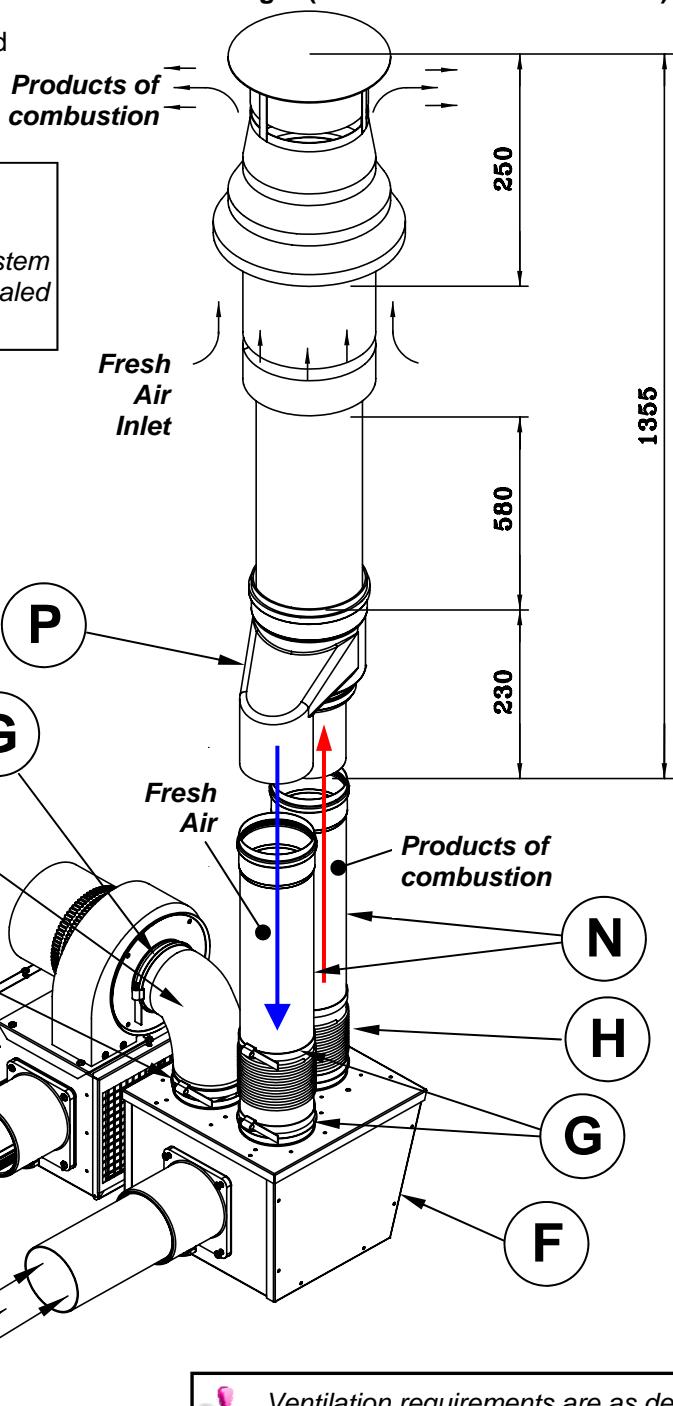


Maximum length = 9m  
Minimum diameter = 100mm  
Maximum no of bends = 2

<b>E</b>	Forced Burner
<b>F</b>	Heat Exchanger
<b>G</b>	100mm (4ins) Clips x2
<b>H</b>	100mm (4ins) Flexible Flue
<b>J</b>	100mm (4ins) Flexible Flue to Fan
<b>M</b>	Shroud for unflued heater installation (supplied as standard)

### Option 4 - Figure 12e. Forced Burner with Heat Exchanger (VSXO with Concentric Flue)

For flued products of combustion and ducted air via concentric pipe.



#### IMPORTANT NOTE

*This option is a type B<sub>23</sub> flue system with ducted air and is not a room sealed balanced flue product.*



Ventilation requirements are as detailed in section 1.9

E	Forced Burner
F	Heat Exchanger
G	100mm (4ins) Clips x2
H	100mm (4ins) Flexible Flue
J	100mm (4ins) Flexible Flue to Fan
N	Flue Extension optional (see max length) avail. 0.25m/0.5m/1.0m
P	Concentric Flue Terminal



Maximum flue length = 9.5m  
Maximum no of bends = 2  
All flues must terminate vertically.  
For further information on flue runs, please refer to BS 5440 pt.1 2000



Ducted air must be used in locations where there is airborne dust or where there is a polluted atmosphere e.g. Chlorinated Vapours.

## 1.11 Technical Details.

No of Injectors	1
Gas Connection	½ in BSP Internal thread
Flue Nominal Bore mm (in)	125 (5)
Unitary Fan Motor Details	230 volt 1 phase 50Hz

Table 5. Burner Settings - Natural Gas (G20)

Heater Model	Heat Input kW		Gas Flowrate (m³/hr)	Injector Pressure (mbar)	Injector Size (mm)	*Size (h x l x w)	*Weight (Kg)	Fan Rating (A)	Fan Type
	Gross	Nett							
<b>VSXO20UT</b>	20.0	18.0	1.9	9.2	7 x 1.7	445x4120x826	104	1.0	2507
<b>VSXO25UT</b>	25.0	22.5	2.4	10.0	7 x 1.9	445x4120x826	104	1.0	2507
<b>VSXO30UT</b>	32.0	28.8	3.1	11.5	7 x 2.1	445x5955x826	142	1.0	2507
<b>VSXO35UT</b>	36.0	32.4	3.5	11.5	7 x 2.3	445x5955x826	142	1.0	2507
<b>VSXO40UT</b>	40.0	36.0	3.8	11.0	7 x 2.7	445x5955x826	142	0.5	2560
<b>VSXO45UT</b>	44.0	39.6	4.2	11.6	7 x 2.9	445x7760x826	182	0.5	2560
<b>VSXO50UT</b>	48.0	43.2	4.6	12.8	7 x 2.5L	445x7760x826	182	0.5	2560
<b>VSO15UT</b>	15.0	13.5	1.4	10.2	7 x 1.3	298x4049x826	97	0.5	2501
<b>VSO20UT</b>	20.0	18.0	1.9	11.0	7 x 1.5	298x4049x826	97	0.5	2501
<b>VSO25UT</b>	25.0	22.5	2.4	9.2	7 x 1.8	298x4049x826	97	0.5	2501
<b>VSO30UT</b>	32.0	28.8	3.1	10.8	7 x 2.0	298x5884x826	135	1.0	2507
<b>VSO35UT</b>	36.0	32.4	3.5	9.0	7 x 2.3	298x5884x826	135	1.0	2507
<b>VSO40UT</b>	40.0	36.0	3.8	8.0	7 x 2.7	298x5884x826	135	0.5	2560
<b>VSO45UT</b>	44.0	39.6	4.2	8.9	7 x 2.9	298x7689x826	175	0.5	2560
<b>VSO50UT</b>	48.0	43.2	4.6	9.1	7 x 2.5L	298x7689x826	175	0.5	2560
Heater Model	Heat Input kW		Gas Flowrate (m³/hr)	Injector Pressure (mbar)	Injector Size (mm)	*Size (h x l x w)	*Weight (Kg)		
	Gross	Nett							
<b>VSO15UH</b>	15.0	13.5	1.4	10.2	7 x 1.3	298x4049x826	97		
<b>VSO20UH</b>	20.0	18.0	1.9	11.0	7 x 1.5	298x4049x826	97		
<b>VSO25UH</b>	25.0	22.5	2.4	9.2	7 x 1.8	298x4049x826	97		
<b>VSO30UH</b>	32.0	28.8	3.1	10.8	7 x 2.0	298x5884x826	135		
<b>VSO35UH</b>	36.0	32.4	3.5	9.0	7 x 2.3	298x5884x826	135		
<b>VSO40UH</b>	40.0	36.0	3.8	8.0	7 x 2.7	298x5884x826	135		
<b>VSO45UH</b>	44.0	39.6	4.2	8.9	7 x 2.9	298x7689x826	175		
<b>VSO50UH</b>	48.0	43.2	4.6	9.1	7 x 2.5L	298x7689x826	175		

Note\* For Optima heaters fitted with decorative end mouldings, Length increases by a further 1056mm, weight increases by 6Kg

**Table 6. Induced VSO Herringbone Settings - Natural Gas (G20)**

Heater Model	Cold HB Pressure		Hot HB Pressure	
	mm H <sub>2</sub> O	mbar	mm H <sub>2</sub> O	mbar
VSO15UH	14.3	1.4	10.2	1.0
VSO20UH	18.4	1.8	10.2	1.0
VSO25UH	25.5	2.5	17.3	1.7
VSO30UH	14.3	1.4	10.2	1.0
VSO35UH	22.4	2.2	16.3	1.6
VSO40UH	20.4	2.0	17.3	1.7
VSO45UH	33.6	3.2	20.4	2.0
VSO50UH	33.6	3.2	20.4	2.0

**Table 7. Flue details - Natural Gas (G20)**

Heater Model	Mass Flow Rate of Flue Gasses (kg/s)	Flue Pressure (Pa) Max Flue Resistance	Flue Gas Temp (°C)
VSXO20UT	0.0130	19	185
VSXO25UT	0.0139	13	205
VSXO30UT	0.0165	33	180
VSXO35UT	0.0167	7.5	185
VSXO40UT	0.0183	35	220
VSXO45UT	0.0210	31	185
VSXO50UT	0.0224	10	195
VSO15UT	0.0114	6	165
VSO20UT	0.0125	19	190
VSO25UT	0.0137	28	225
VSO30UT	0.0189	29	205
VSO35UT	0.0207	24	235
VSO40UT	0.0253	28	240
VSO45UT	0.0253	26	210
VSO50UT	0.0257	27	220

**Tables 8. Burner Settings - Propane Gas (G31)**

Heater Model	Heat Input kW		Flowrate (l/hr)	Injector Pressure (mbar)	Injector Size (mm)	*Size (h x l x w)	*Weight (Kg)	Fan Rating (A)	Fan Type
	Gross	Nett							
VSO15UT	15.0	13.9	2.18	13.5	7 x 1.0	298x4049x826	97	0.5	2501
VSO20UT	20.0	18.5	2.88	12.4	7 x 1.2	298x4049x826	97	1.0	2507
VSO25UT	25.0	23.1	3.60	13.3	7 x 1.3	298x4049x826	97	1.0	2507
VSO30UT	32.0	29.6	4.60	22.5	7 x 1.3	298x5884x826	135	0.5	2560
VSO35UT	36.0	33.3	5.12	22.4	7 x 1.4	298x5884x826	135	0.5	2560
VSO40UT	40.0	37.0	5.68	18.4	7 x 1.5	298x5884x826	135	0.5	2560
VSO45UT	44.0	40.7	6.25	14.9	7 x 1.7	298x7689x826	175	0.5	2560
VSO50UT	48.0	44.4	6.82	14.3	7 x 1.8	298x7689x826	175	0.5	202126

Heater Model	Heat Input kW		Flowrate (l/hr)	Injector Pressure (mbar)	Injector Size (mm)	*Size (h x l x w)	* Weight (Kg)
	Gross	Nett					
VSO15UH	15.0	13.9	2.18	13.5	7 x 1.0	298x4049x826	97
VSO20UH	20.0	18.5	2.88	12.4	7 x 1.2	298x4049x826	97
VSO25UH	25.0	23.1	3.60	13.3	7 x 1.3	298x4049x826	97
VSO30UH	32.0	29.6	4.60	22.5	7 x 1.3	298x5884x826	135
VSO35UH	36.0	33.3	5.12	22.4	7 x 1.4	298x5884x826	135
VSO40UH	40.0	37.0	5.68	18.4	7 x 1.5	298x5884x826	135
VSO45UH	44.0	40.7	6.25	14.9	7 x 1.7	298x7689x826	175
VSO50UH	48.0	44.4	6.82	14.3	7 x 1.8	298x7689x826	175

Note\* For Optima heaters fitted with decorative end mouldings, Length increases by a further 1056mm, weight increases by 6Kg

**Table 9. Induced VSO Herringbone Settings - Propane Gas (G31)**

Model	Cold HB Pressure		Hot HB Pressure	
	mm H <sub>2</sub> O	mbar	mm H <sub>2</sub> O	mbar
VSO15UH	19.4	1.9	15.3	1.5
VSO20UH	22.4	2.2	17.3	1.7
VSO25UH	24.5	2.4	17.3	1.7
VSO30UH	27.5	2.7	19.4	1.9
VSO35UH	31.6	3.1	20.4	2.0
VSO40UH	38.7	3.8	23.5	2.3
VSO45UH	36.7	3.6	23.5	2.3
VSO50UH	36.7	3.6	28.6	2.8

**Table 10. Flue details - Propane Gas (G31)**

Heater Model	Mass Flow Rate of Flue Gasses (kg/s)	Flue Pressure (Pa) Maximum Flue Resistance	Flue Gas Temp (°C)
VSO15UT	0.0152	12.5	182
VSO20UT	0.0200	24.9	214
VSO25UT	0.0196	15.0	232
VSO30UT	0.0201	16.2	210
VSO35UT	0.0238	27.4	240
VSO40UT	0.0255	29.9	247
VSO45UT	0.0210	31.4	233
VSO50UT	0.0334	43.6	228

## Notes

## Notes

## 2. User & Operating Instructions.

### 2.1 To Start the Heater

1. Ensure gas supply is turned on.
2. Electrical supply to the controls is on.
3. Ensure that the controls are correctly set i.e.;
  - Clock is correctly set.
  - Heater program is correctly set.
  - Required room temp is correctly set
4. Once the heating controller 'calls for heat' power will be supplied to the heater(s). The red neon will then illuminate.
5. After a pre-purge period of 10 seconds the burner will ignite and the amber neon will then illuminate.
6. If lockout occurs press the lockout reset button (if available), or switch off electrical supply and restart after 15 seconds.
7. If lockout occurs three times consecutively switch off and isolate the gas and electricity supplies.

Contact the AmbiRad Service department.

### 2.2. To Switch Off Heater

1. Switch off electrical supply to the heater. The burner will stop and the fan will shut off.
2. If the heater is to be switched off for periods in excess of one week it is highly recommended that both the gas and the electrical supplies are turned off.

### 2.3. Routine Maintenance between Service Intervals

After ensuring that the heater is cold and mains electric isolated, cleaning of the reflectors with a soft cloth and a mild detergent (non solvent based cleaners only) in water can be undertaken.

Additional removal of dust from the radiant tubes, burner and heat exchanger can be undertaken.

### 2.4 Frequency of Servicing

The manufacturer recommends that to ensure continued efficient and safe operation of the appliance, the heater is serviced annually by a competent person e.g. every year in normal working conditions but in exceptional dusty or polluted conditions more frequent servicing may be required.

The manufacturer offers a maintenance service.

Details are available on request.

For Service requirements, please contact AmbiRad.

For further technical and service support visit our Support Information Database at [www.s-i-d.co.uk](http://www.s-i-d.co.uk)



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